



India Meteorological Department  
(Ministry of Earth Sciences)

BULLETIN NO. 53 (ARB/01/2023)

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FROM: INDIA METEOROLOGICAL DEPARTMENT (FAX NO. 24643965/24699216/24623220)

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**Sub: Extremely Severe Cyclonic Storm “Biparjoy” (pronounced as “Biporjoy”) over Northeast and adjoining Eastcentral Arabian Sea: Cyclone Warning for Saurashtra & Kutch Coasts (Orange Message)**

The extremely severe cyclonic storm “Biparjoy” (pronounced as “Biporjoy”) over eastcentral and adjoining northeast Arabian Sea moved nearly northwestwards with a speed of 08 kmph during past 6-hours and lay centered at 2030 hours IST of today, the 12<sup>th</sup> June, 2023 over Northeast and adjoining Eastcentral Arabian Sea near latitude 20.0°N and longitude 67.2°E, about 320 km southwest of Porbandar, 330 km southwest of Devbhumi Dwarka, 390 km south-southwest of Jakhau Port, 400 km south-southwest of Naliya and 540 km south of Karachi (Pakistan).

It is very likely to move nearly northwards till 14<sup>th</sup> morning, then move north-northeastwards and cross Saurashtra & Kutch and adjoining Pakistan coasts between Mandvi (Gujarat) and Karachi (Pakistan) near Jakhau Port (Gujarat) by evening of 15<sup>th</sup> June as a very severe cyclonic storm with maximum sustained wind speed of 125-135 kmph gusting to 150 kmph.

Forecast track and intensity are given below:

Date/Time(IST)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
12.06.23/2030	20.0/67.2	160-170 Gusting To 190	Extremely Severe Cyclonic Storm
12.06.23/2330	20.1/67.1	155-165 Gusting To 185	Very Severe Cyclonic Storm
13.06.23/0530	20.4/67.0	150-160 Gusting To 180	Very Severe Cyclonic Storm
13.06.23/1130	24.8/67.1	145-155 Gusting To 170	Very Severe Cyclonic Storm
13.06.23/1730	21.2/67.2	140-150 Gusting To 165	Very Severe Cyclonic Storm
14.06.23/0530	21.8/67.4	135-145 Gusting To 160	Very Severe Cyclonic Storm
14.06.23/1730	22.4/67.7	130-140 Gusting To 155	Very Severe Cyclonic Storm
15.06.23/0530	23.0/68.1	125-135 Gusting To 150	Very Severe Cyclonic Storm
15.06.23/1730	23.5/68.7	90-100 Gusting To 110	Severe Cyclonic Storm
16.06.23/0530	24.0/69.4	50-60 Gusting To 70	Deep Depression
16.06.23/1730	24.5/70.3	30-40 Gusting To 50	Well Marked Low Pressure Area

**(i) Heavy Rainfall warning for Gujarat (Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts):**

- Light to moderate rainfall at many places in coastal districts of Saurashtra & Kutch with isolated heavy rainfall on 13<sup>th</sup> June.
- Light to moderate rainfall at most places with heavy to very heavy rainfall at isolated places very likely over Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts of Saurashtra & Kutch on 14<sup>th</sup> June.
- The intensity of rainfall would increase with heavy to very heavy rainfall at a few places and extremely heavy falls at isolated places very likely over Kutch, Devbhumi Dwarka & Jamnagar and heavy to very heavy rainfall at a few places over Porbandar, Rajkot, Morbi & Junagarh districts of Gujarat on 15<sup>th</sup> June.
- Isolated heavy rainfall is very likely over remaining districts of Saurashtra and north Gujarat region on 15<sup>th</sup> June.
- Light to moderate rainfall at most places with heavy to very heavy rainfall at isolated places very likely over north Gujarat and adjoining south Rajasthan on 16<sup>th</sup> June.

**(ii) Wind warning:**

**12<sup>th</sup> June:** Gale wind speed reaching 160-170 kmph gusting to 190 kmph is likely to prevail over northeast and adjoining eastcentral Arabian Sea. Squally wind speed reaching 40-50 kmph gusting to 60 kmph is likely over adjoining areas of westcentral Arabian Sea.

**13<sup>th</sup> June:** Gale wind speed reaching 150-160 kmph gusting to 180 kmph is likely to prevail over northeast Arabian Sea and becoming 140-150 kmph gusting to 165 kmph from evening. Gale wind speed reaching 80-90 kmph gusting to 100 kmph is likely to prevail over adjoining areas of eastcentral Arabian Sea. Squally wind speed reaching 40-50 kmph gusting to 60 kmph is likely over adjoining areas of northwest Arabian Sea.

**14<sup>th</sup> June:** Gale wind speed reaching 135-145 kmph gusting to 160 kmph is likely to prevail over northeast Arabian Sea. Squally wind speed reaching 40-50 kmph gusting to 60 kmph is likely over adjoining areas of eastcentral Arabian Sea.

**15<sup>th</sup> June:** Gale wind speed reaching 125-135 kmph gusting to 150 kmph is likely to prevail over northeast Arabian Sea and likely to decrease becoming 90-100 kmph gusting to 110 kmph from evening. Squally wind speed reaching 40-50 kmph gusting to 60 kmph is likely over adjoining areas of eastcentral Arabian Sea.

**16<sup>th</sup> June:** Squally wind speed reaching 40-50 kmph gusting to 60 kmph is likely over adjoining areas of eastcentral Arabian Sea till evening.

**Wind warning along & off Saurashtra & Kutch coasts (Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts) including Gulf of Kutch:**

- Squally wind speed reaching 45-55 kmph gusting to 65 kmph is very likely on 12<sup>th</sup>, becoming 50-60 kmph gusting to 70 kmph from 13<sup>th</sup> morning to 14<sup>th</sup> June morning.
- It would increase becoming Gale wind speed reaching 65-75 kmph gusting to 85 kmph from 14<sup>th</sup> June morning along & off Porbandar & Devbhoomi Dwarka district coasts. It would become 125-135 kmph gusting to 150 kmph from 15<sup>th</sup> morning for subsequent 12 hours along & off Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts. Thereafter it would decrease gradually becoming 45-55 kmph gusting to 65 kmph over north Gujarat and adjoining south Rajasthan from 16<sup>th</sup> morning to evening.
- Squally wind speed reaching 55-65 kmph gusting to 75 kmph very likely to prevail along & off remaining districts Saurashtra coast on 14<sup>th</sup> & 15<sup>th</sup> June and 30-40 kmph gusting to 50 kmph during 16<sup>th</sup> morning to evening.

**(iii) Sea condition**

**12<sup>th</sup> June:** Sea condition is likely to be phenomenal over northeast and adjoining eastcentral Arabian Sea and rough over adjoining westcentral Arabian Sea.

**13<sup>th</sup> June:** Sea condition is likely to be phenomenal over northeast and adjoining eastcentral Arabian Sea and rough over adjoining northwest Arabian Sea

**14<sup>th</sup> June:** Sea condition is likely to be phenomenal over northeast Arabian Sea and rough to very rough sea condition is likely over adjoining areas of eastcentral Arabian Sea.

**15<sup>th</sup> June:** Sea condition is likely to be phenomenal to high over northeast Arabian Sea and very rough to rough over adjoining eastcentral Arabian Sea till 15<sup>th</sup> June evening and improve thereafter.

**Along & off Saurashtra & Kutch coasts:**

Sea condition is likely to be rough to very rough till 14<sup>th</sup> morning and high to phenomenal thereafter till 15<sup>th</sup> June evening and would improve thereafter.

**(iv) Storm Surge Warning (Kutch, Devbhumi Dwarka, Porbandar, Jamnagarh and Morbi districts)**

Storm surge of about 2 -3 m above the astronomical tide is likely to inundate the low lying areas of above districts during the time of landfall. The astronomical tides along these districts could be upto 3-6 meters in different places.

**(v) Damage expected over Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Morbi & Junagarh & Rajkot districts of Gujarat on 15<sup>th</sup> June:**

- Total destruction of thatched houses/ extensive damage to kutcha houses. Some damage to Pucca houses.
- Potential threat from flying objects.
- Bending/ uprooting of power and communication poles.
- Major damage to Kutcha and Pucca roads. Flooding of escape routes. Disruption of railways, overhead power lines and signalling systems.
- Widespread damage to standing crops, plantations, orchards, falling of green coconuts and tearing of palm fronds. Blowing down of bushy trees like mango.
- Small boats, country crafts may get detached from moorings.

- Visibility severely affected due to salt spray.

**(vi) Fishermen Warning & Action Suggested (Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts) and for Offshore & Onshore Industries (Graphics Attached):**

- Total suspension of fishing operations over
  - Eastcentral and adjoining Westcentral Arabian Sea till 15<sup>th</sup> June.
  - Northeast Arabian Sea during 12<sup>th</sup> -15<sup>th</sup> June
- Those out at sea are advised to return to coast.
- Judicious regulation of offshore and onshore activities.
- Ports along the west coast of India may take necessary precautions.
- Naval base operations may maintain necessary precautions.
- Movement in motor boats and small ships all & off these coasts to be avoided.
- Mobilise evacuation from coastal areas of Saurashtra and Kutch (Kutch, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts).
- Judicious regulation of rail and road traffic.
- People in affected areas to remain indoors.
- Tourism activities may be restricted over these areas.
- Preparatory actions before the cyclones.

**The system is under continuous surveillance and the next message will be issued at 0230 hours IST of tomorrow, the 13<sup>th</sup> June, 2023.**

**(Krishna Mishra)**  
**Scientist C, Cyclone Warning Division, New Delhi**

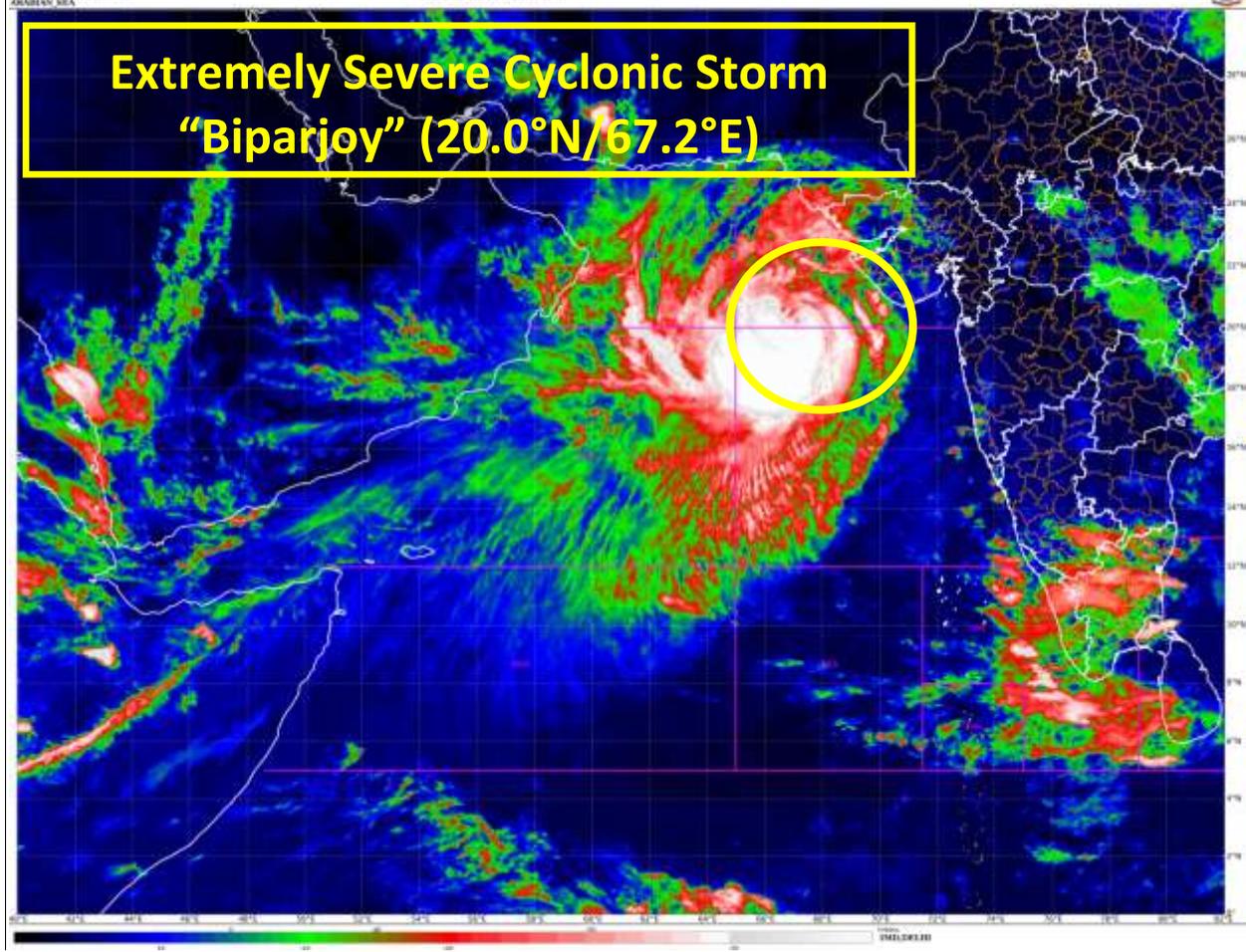
*Copy to: ACWC Kolkata/ ACWC Chennai/ CWC Bhubaneswar/CWCVisakhapatnam/CWC Ahmedabad/ MO Port Blair/MC Raipur/MC Bhopal/MC Hyderabad/RMC Nagpur*

**LEGEND: Heavy Rainfall:** 64.5 to 115.5mm, **Very Heavy Rainfall:** 115.6 to 204.4mm **Most Places:** more than 76% of total stations, **Isolated Places:** Less than 25% of total

NET (SRAG) 080  
150, TBS, TROP 16.0 km  
MAGNETIC SWA

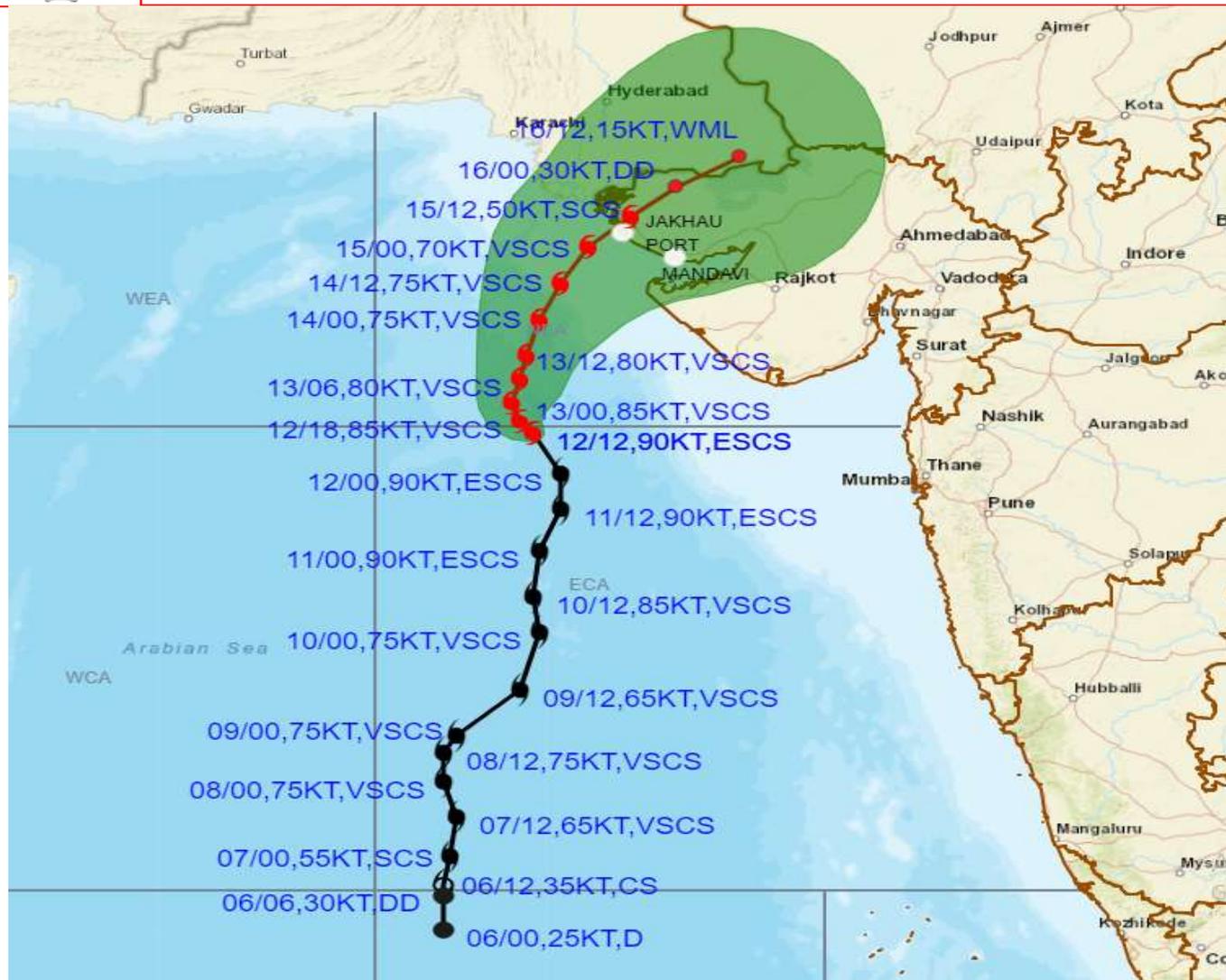
11-06-2023 10:00 to 18:00 GMT  
11-06-2023 12:00 to 22:00 IST

**Extremely Severe Cyclonic Storm  
"Biparjoy" (20.0°N/67.2°E)**





**OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF EXTREMELY SEVERE CYCLONIC STORM "BIPARJOY" OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA BASED ON 1200 UTC (1730 IST) OF 12<sup>TH</sup> JUNE 2023.**



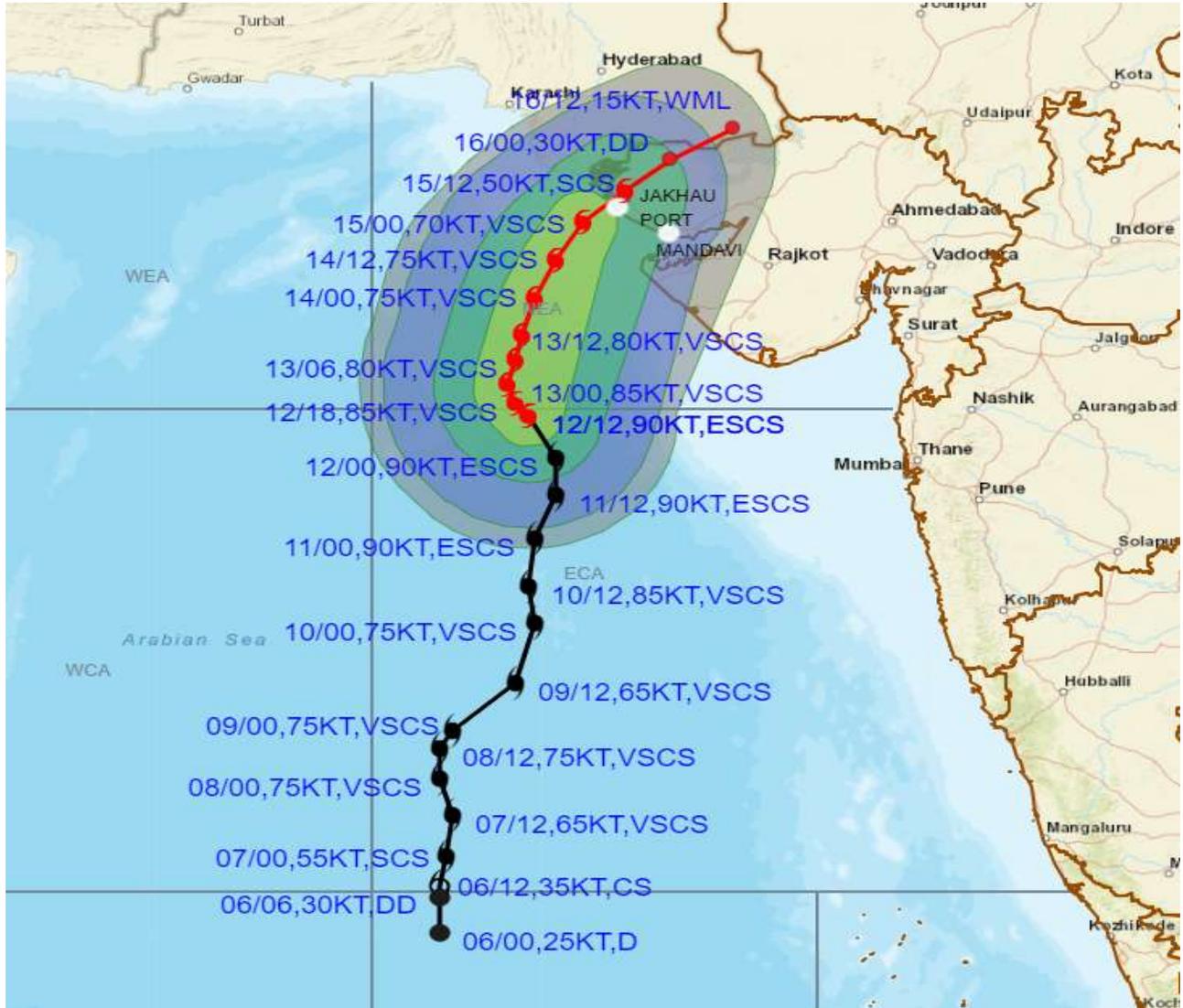
DATE/TIME IN UTC  
IST=UTC + 0530

L: LOW PRESSURE AREA  
WML: WELL MARKED LOW PRESSURE AREA  
D: DEPRESSION (17-27 KT)  
DD: DEEP DEPRESSION (28-33 KT)  
CS: CYCLONIC STORM (34-47 KT)  
SCS: SEVERE CYCLONIC STORM (48-63KT)  
VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)  
ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)  
SuCS: SUPER CYCLONIC STORM ( $\geq$  120 KT)

- LESS THAN 34 KT
- 34-47 KT
- $\geq$  48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

STATIONS	DISTANCE(KM) AND DIRECTION FROM STATIONS			
	13.06.23/1200	14.06.23/1200	15.06.23/1200	16.06.23/1200
PORBANDAR	260, W	220, WNW	230, NNW	320, NNE
DWARKA	230, SW	140, W	140, NNW	270, NNE
JAKHAU PORT	260, SSW	130, SW	40, NNE	220, NE
NALIYA	280, SW	150, SW	40, NNW	200, NE
KARACHI AIRPORT	410, S	280, SSE	230, SE	320, E

**OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF EXTREMELY SEVERE CYCLONIC STORM "BIPARJOY" OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA BASED ON 1200 UTC (1730 IST) OF 12<sup>TH</sup> JUNE 2023.**



DATE/TIME IN UTC  
IST=UTC + 0530

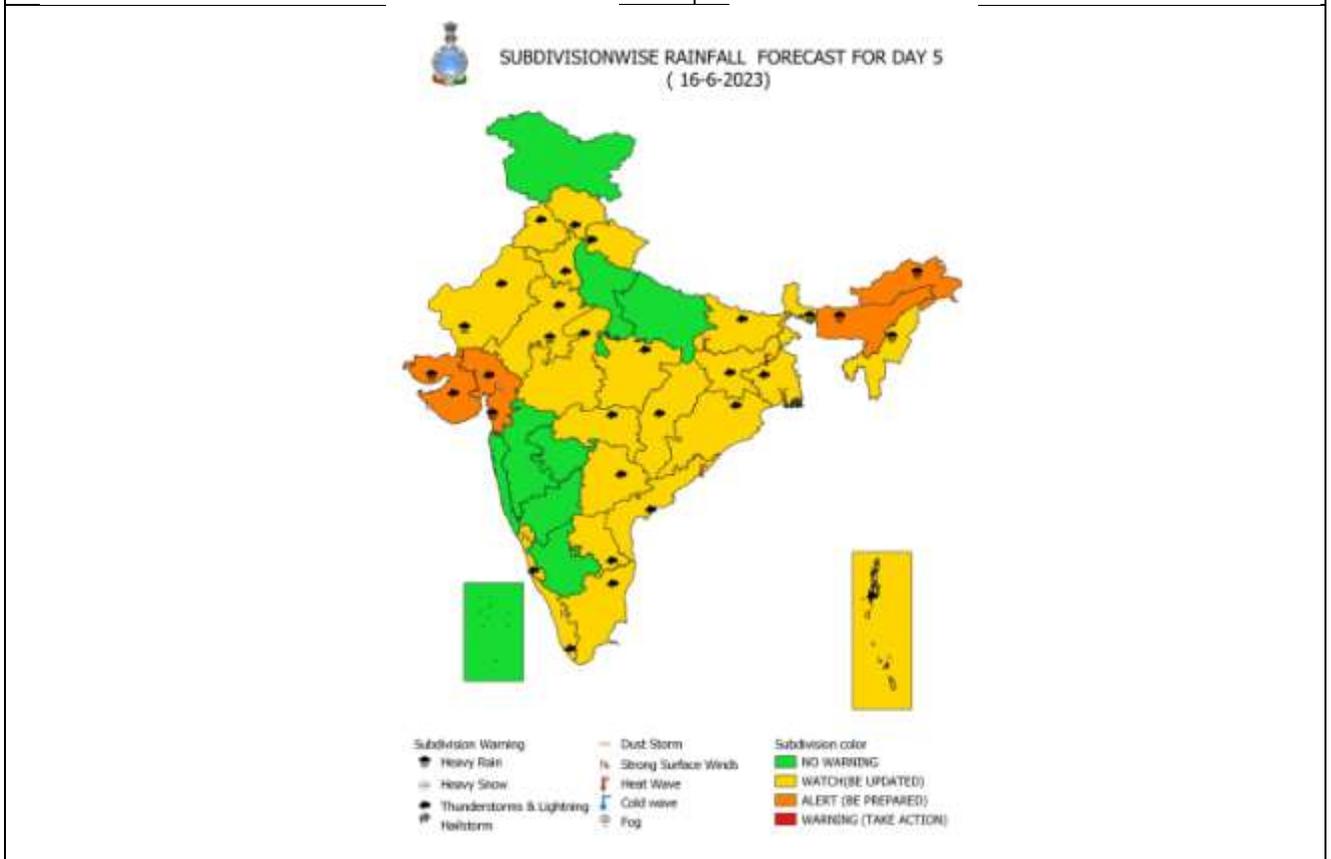
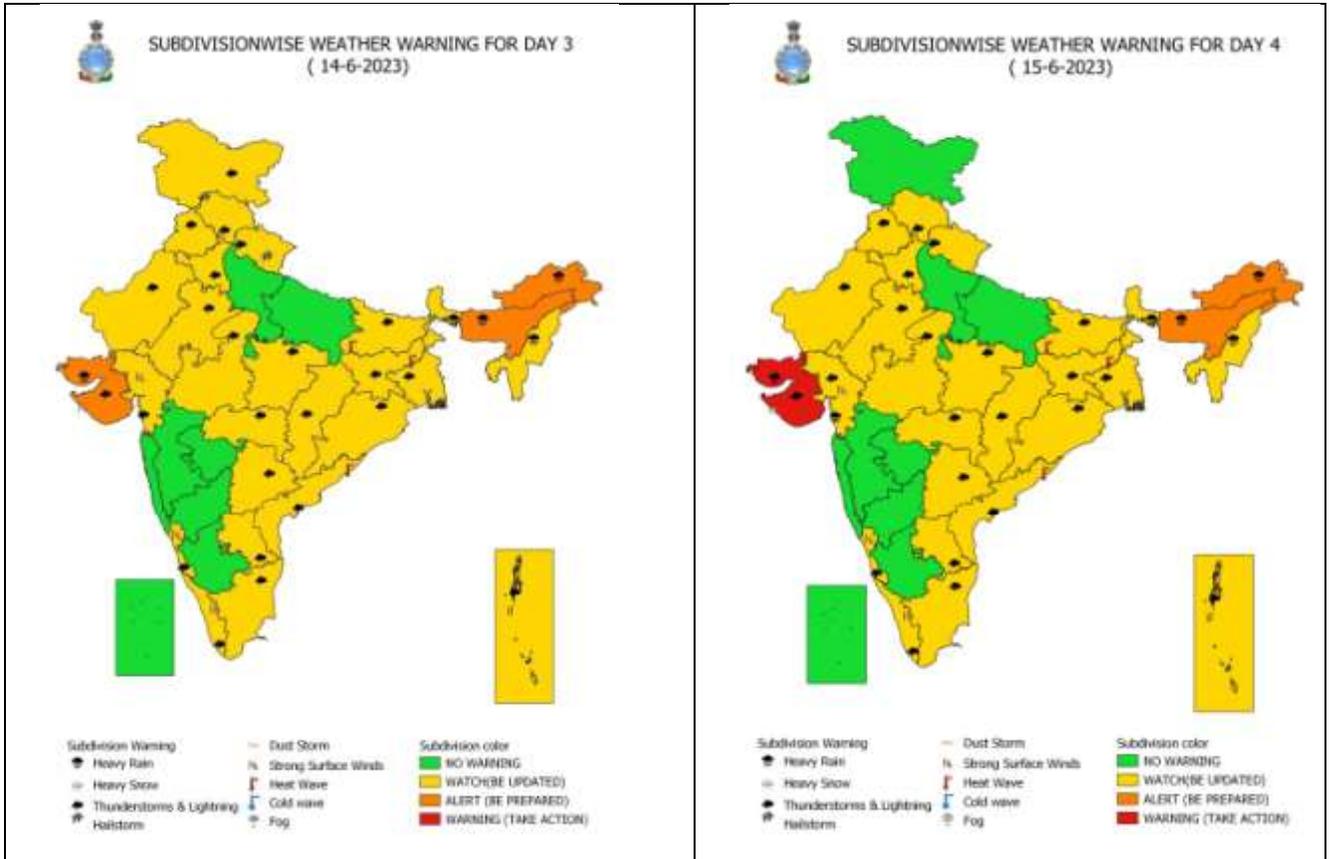
L: LOW PRESSURE AREA  
WML: WELL MARKED LOW PRESSURE AREA  
D: DEPRESSION (17-27 KT)  
DD: DEEP DEPRESSION (28-33 KT)  
CS: CYCLONIC STORM (34-47 KT)  
SCS: SEVERE CYCLONIC STORM (48-63KT)  
VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)  
ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)  
SuCS: SUPER CYCLONIC STORM (≥ 120 KT)

● LESS THAN 34 KT  
○ 34-47 KT  
● ≥ 48 KT  
— OBSERVED TRACK  
— FORECAST TRACK  
● CONE OF UNCERTAINTY  
AREA OF MAXIMUM SUSTAINED WIND SPEED:  
— 28-33 KT (52-61 KMPH)  
— 34-49 KT (62-91 KMPH)  
— 50-63 KT (92-117 KMPH)  
— ≥ 64 KT (≥ 118 KMPH)

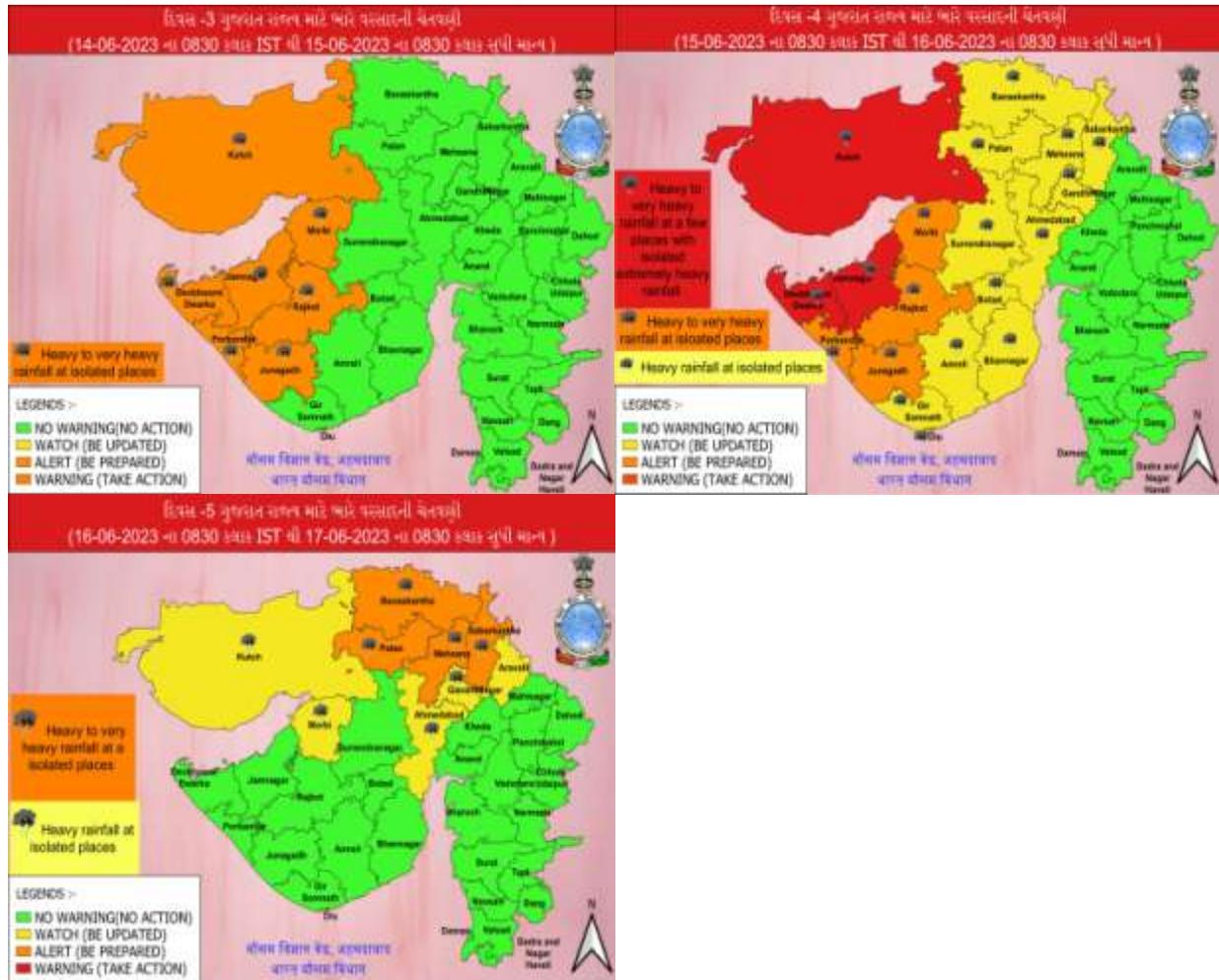
**IMPACT OVER THE SEA**

MSW (knot/kmph)	Impact	Action
28-33 (52-61)	Very rough seas	Total suspension of fishing operations
34-49 (62-91)	High to very high seas	Total suspension of fishing operations
50-63 (92-117)	Very high seas	Total suspension of fishing operations
≥ 64 (≥ 118)	Phenomenal	Total suspension of fishing operations

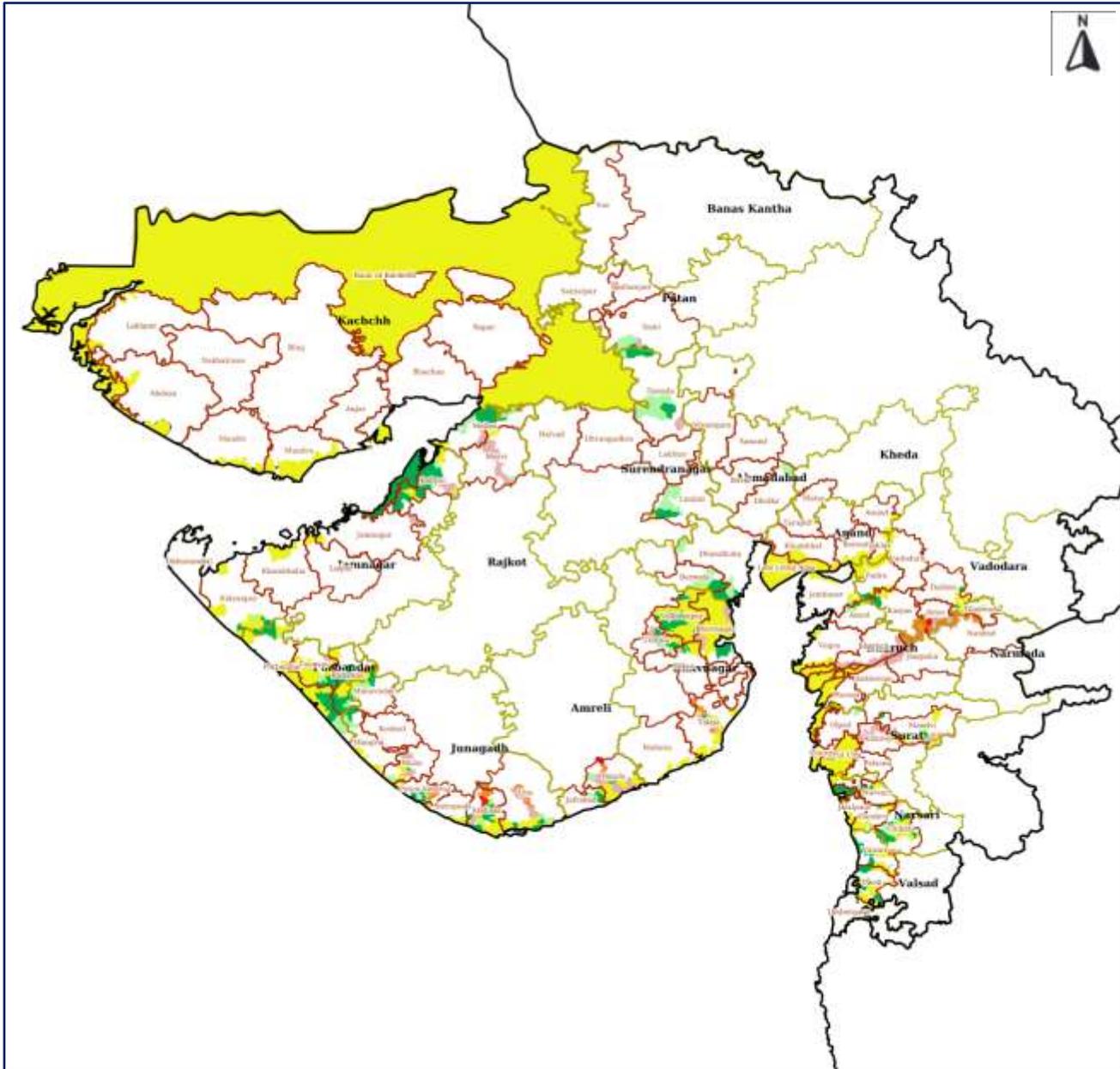
# Heavy Rainfall Warning for 14<sup>th</sup> to 16<sup>th</sup> June 2023



# District-wise Heavy Rainfall Warning Maps for 15<sup>th</sup> to 17<sup>th</sup> June

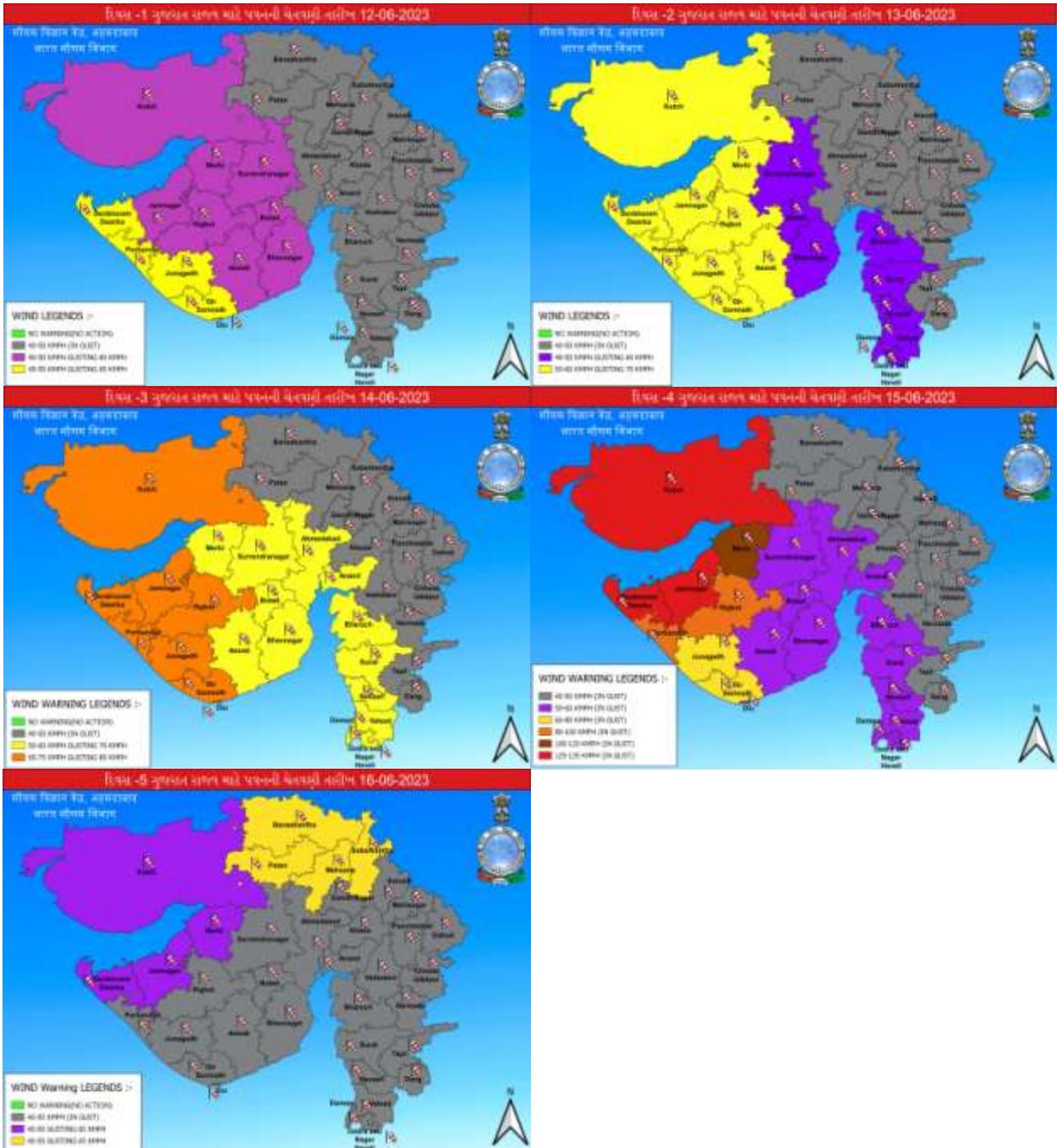


## Hazard Map – Flood Depth for Cyclone Biparjoy Flood

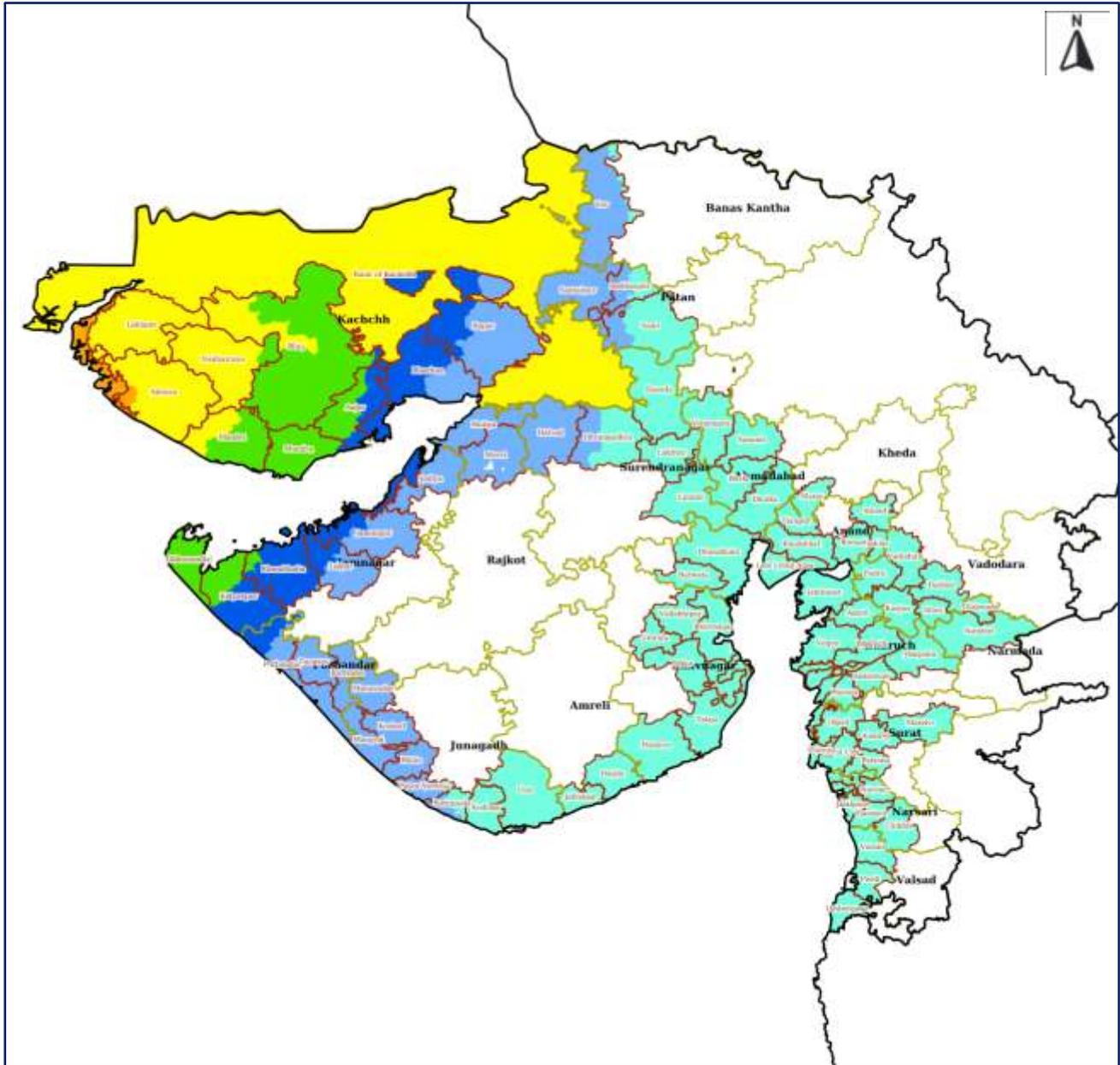


L E G E N D	<span style="border: 1px solid black; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> State Boundary	<span style="border: 1px solid yellow; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> District Boundary	<span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Tehsil Boundary	<span style="border: 1px solid orange; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Village Boundary	
	<span style="display: inline-block; width: 15px; height: 10px; background-color: lightgreen; margin-right: 5px;"></span> Very Low (Less than 0.25 m)	<span style="display: inline-block; width: 15px; height: 10px; background-color: darkgreen; margin-right: 5px;"></span> Low (0.25 to 0.50 m)	<span style="display: inline-block; width: 15px; height: 10px; background-color: yellow; margin-right: 5px;"></span> Moderate (0.50 to 1.0 m)	<span style="display: inline-block; width: 15px; height: 10px; background-color: pink; margin-right: 5px;"></span> High (1.0 to 2.0 m)	<span style="display: inline-block; width: 15px; height: 10px; background-color: brown; margin-right: 5px;"></span> Very High (2.0 to 3.0 m)

# District-wise Wind Warning Maps for 12<sup>th</sup> to 16<sup>th</sup> June

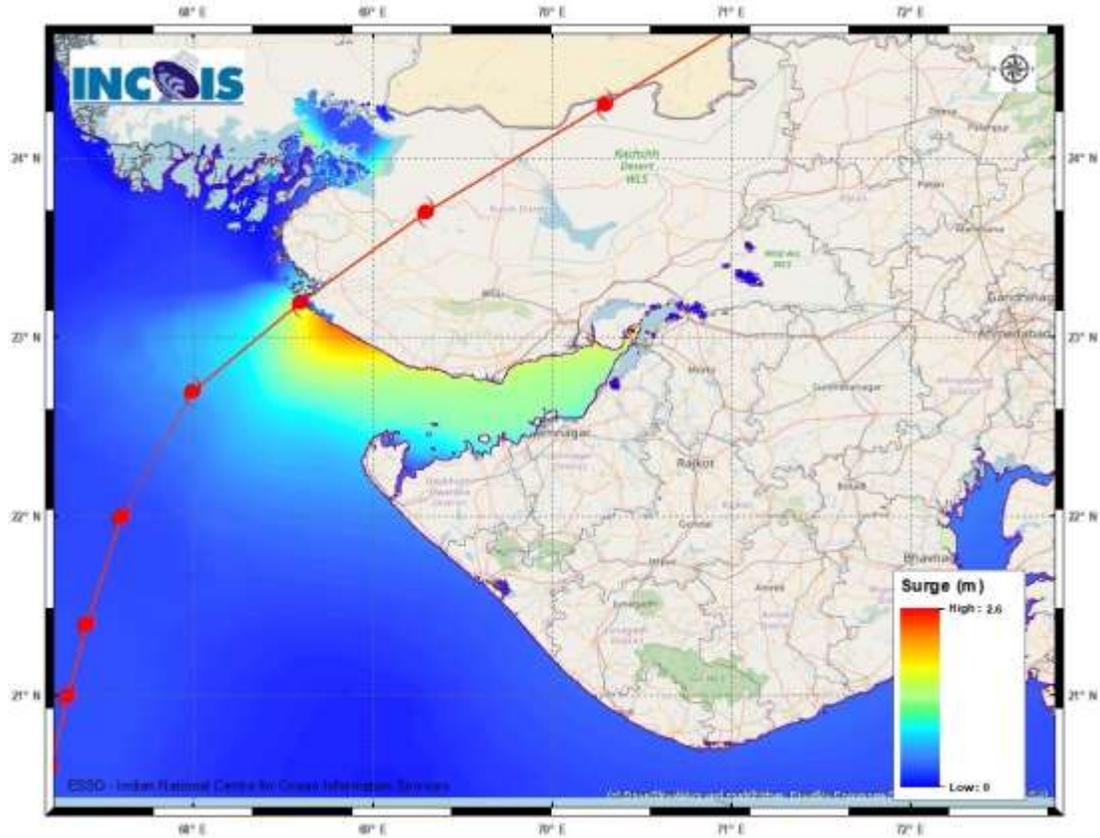


## Hazard Map - Wind Speeds for Cyclone Biparjoy Wind



<b>L E G E N D</b>	State Boundary	District Boundary	Tehsil Boundary	Village Boundary
	Wind Speed (Less than 31 Km/h)	Wind Speed (31 - 49 Km/h)	Wind Speed (49 - 61 Km/h)	
	Wind Speed (61 - 88 Km/h)	Wind Speed (88 - 117 Km/h)	Wind Speed (117- 166 Km/h)	
	Wind Speed (166 - 221 Km/h)	Wind Speed (Greater than 221 Km/h)		

## Storm Surge Warning Map based on Forecast Track



### Astronomical Tide on 15<sup>th</sup> June 2023

Station	Time (IST)	Height (m)
Porbandar	09:37	2.61
Navlakhi	13:38	7.54
OKHA	11:36	3.74
DEENDAYAL PORT (KANDLA)	13:02	6.79

## Fishermen warning graphics

